

Details of the electronic excitations in the near-nodal region of the Fermi surface in Bi 2212

Tonica Valla

Physics Department, Brookhaven National Laboratory, Upton

After serving exclusively as a tool for mapping band structure in solid materials for many years, Angular Resolved Photoemission Spectroscopy (ARPES) has recently advanced to the level where it is capable of detecting fine effects of many-body interactions in the electronic systems. Interaction effects are observable directly in measured spectra and quantities such as electronic self-energies and single-particle excitation gaps can be extracted as momentum (k-) resolved quantities. Here, we will present high resolution ARPES experiments on high quality Bi₂Sr₂CaCu₂O_{8+δ} samples that have uncovered extremely coherent excitations in the near-nodal region of the Fermi surface. This observation has enabled more detailed insight into the intrinsic properties of these excitations. Some of the "fine features" that have not been previously resolved, and the effects of impurities/inhomogeneities on them will be discussed.